6. PROPOSED MITIGATION AND COMMUNITY ENHANCEMENTS

6.1 WETLAND MITIGATION

The Maryland Tidal Wetlands Act, the Federal Clean Water Act Section 404, and Section 10 of the Rivers and Harbors Act regulate the filling of tidal open water and require the submittal of a mitigation plan when there are unavoidable impacts to waters of the United States (please refer to Section 3.2.2.2 for a discussion on mitigation sequencing). Mitigation packages are evaluated by the Joint Evaluation Committee, which is made up of representatives from State and Federal regulatory agencies. The scope of the proposed project requires an exhaustive investigation by the Maryland Port Administration (MPA), the permit applicant, into potential mitigation projects that would provide environmental benefits in the Masonville area.

In their search for potential mitigation projects, the MPA initiated efforts to include community representatives. Through the Harbor Team and discussions with the Brooklyn and Curtis Bay Coalition, Baltimore City's Department of Planning, and the Baltimore Development Corporation, the community voiced their opinion on mitigation projects that would be beneficial to the community as well as to the local environment.

The proposed Masonville dredged material containment facility (DMCF) would require mitigation to offset the loss of 129 acres of tidal open water, 1 acre of vegetated wetlands and 10 acres of upland in the Chesapeake Bay Critical Area. The proposed mitigation package includes community enhancements as well as mitigation. Though these community enhancements are included in the mitigation package, they are not considered as offsets to aquatic impacts. The community enhancements would benefit the residential areas in the vicinity of the proposed Masonville DMCF. A Tier I mitigation package was developed of the projects designed to compensate for the proposed action and all of the Tier I options will be implements (unless determined not to be feasible as designs are further refined). A Tier II mitigation package was developed in case Tier I projects are unsuccessful or not feasible, in which case Tier II projects would be implemented. It is expected that the need and decision to implement a Tier II option would be made through the adaptive management process which will be implemented concurrently with the initiation of the mitigation options. Further, it is expected that decisions regarding adaptive management and implementation of Tier II options would initially be made by the MPA with approval(s) from the regulatory and advisory agencies of the Joint Evaluation Committee. The Tier I mitigation package is described in detail in this chapter and the Tier II mitigation package is available in Appendix M. This chapter outlines the process used to select the proposed mitigation sites that were considered and describes the recommended mitigation sites, other mitigation sites considered, and proposed community enhancement projects.

The dollar amounts that may appear in these sections for mitigation proposals are not USACE figures, nor are they to be construed as minimum or maximum expenditures that may be incurred to perform compensatory mitigation obligations pursuant to a USACE permit, if issued. They are estimates, derived for comparative purposes, to allow some reviewers to gauge the level of compensation proposed for each element. In addition, a USACE permit (if issued) would contain requirements to mitigate for permanent impacts to aquatic resources though the State

may undertake other projects it deems beneficial to address other project impacts and community needs.

6.1.1 Development of the Wetland Mitigation Plan

6.1.1.1 Harbor Team – Initial Suggestions

The *Final Report of the Harbor Team* submitted in October 2003 (Harbor Team 2003) provided policy recommendations and standards that should be applied to all projects developed as State Dredged Material Management Program (DMMP) options. Among the recommendations were the following, which pertain to mitigation and community enhancement projects:

1) Options must add value to the nearby communities.
2) Public access to the water must be provided, where possible.
3) Where placement options are combined with community enhancement options, the projects are to be considered comprehensively, not separately.
4) Community enhancement projects should be designed to improve water quality and aquatic habitat, where possible.
5) Community oversight committees will be established to work with MPA and other stakeholders in implementing any project pertaining to Masonville.

In addition to these policy recommendations, the Harbor Team also specifically recommended the further study of a placement site at Masonville and a Masonville Cove enhancement project. This Masonville Cove enhancement project "could restore wetlands, provide public access and enhance beach habitat in addition to improving views of the cove" (Harbor Team 2003).

6.1.1.2 Continuing Outreach

The MPA contacted the surrounding community and Port stakeholders for guidance on selecting mitigation projects and community enhancements. Representatives of the MPA worked together with the Harbor Team and the Brooklyn-Curtis Bay Coalition (BCBC) and offered the following suggestions for improving Masonville Cove, which is one of the few remaining undeveloped shoreline areas in the Baltimore Harbor:

- Allow limited (controlled) public access
- Cleanup and restore shoreline
- Create shoreline trails
- Create observation towers
- Enhance habitat
- Create a bird sanctuary
- Add passive recreation opportunities
- Create an education center
- Construct a canoe and kayak launch
- Enhance and create wetlands
- Provide opportunities for community stewardship

6.1.2 Conceptual Mitigation Plan

The community's input led to the development of the Tier I mitigation package, which centers on the improvement of habitat and the public's interaction with nature in the Masonville Cove. State and Federal regulatory and resource management agencies determined that the proposed mitigation projects within Masonville Cove would not provide sufficient mitigation due to the size and scope of the proposed Masonville DMCF and, therefore, additional projects outside the area are included in the mitigation plan. The mitigation package is still under development. The Tier I mitigation package, community enhancements, and benefits from the DMCF beyond those in the Cove are described in the following section. The MPA would pay for all compensatory mitigation and community enhancements. The total estimated cost for the Tier I mitigation package (including community enhancements) is approximately $20.2 million. Appendix M contains fact sheets for each of the proposed mitigation projects and an estimated cost for each mitigation project in the conceptual package. The following sections provide information on specific mitigation projects.

A Tier II mitigation package, to be used if any of the proposed projects from the Tier I mitigation package are unsuccessful, has been developed based on local, state, and federal agency input. These projects are being ranked by the Bay Enhancement Working Group (BEWG). This ranking will be used to determine what order these projects would be implemented in if one of the Tier I projects is unsuccessful. The draft Tier II mitigation package is available in Appendix M.

6.1.2.1 Sites

The Tier I mitigation package includes projects in Masonville Cove and also projects outside of the Masonville Cove area, but within the Patapsco River watershed that were added to supplement the Cove mitigation. In addition to these supplemental projects, the DMCF project also provides environmental benefits (Section 4.9). The following describes the additional projects and benefits.

Masonville Cove

Masonville Cove is located along the southern shoreline of the Middle Branch of the Patapsco River. The Cove lies immediately west of the existing Masonville Marine Terminal (MMT) and the future MMT Phase 2, which is currently being developed on a previously completed dredged material placement site. Other adjoining properties and facilities include The Arundel Corporation, Frankfurst Avenue, and undeveloped land owned by MPA.

The proposed mitigation and community enhancement project site encompasses approximately 70 acres of water and is surrounded by approximately 54 acres of undeveloped land.

The shoreline of Masonville Cove is littered with heavy industrial debris including large timber piles from abandoned docks and rusting metallic structures. Additionally, large amounts of trash can be found throughout the area.

The site has a history of being used by bird species typical of the Chesapeake Bay region. Based on field observations by experienced birders and ornithologists, large numbers of birds and waterfowl can be seen in Masonville Cove. Section 2.1.8.1 contains additional information on observed bird usage of the Cove.

Masonville Cove is designated as a Resource Conservation Area (RCA) in accordance with COMAR 27.01.02.05.05. Masonville Cove is also a Designated Habitat Protection Area (DHPA), as determined by the City of Baltimore (City of Baltimore 2002). The DHPA has been designated based on historical use of the open water area of the Cove adjacent to the existing MMT by wintering and migrating waterfowl.

The mitigation package for the Masonville Cove offers on-ground environmental enhancement projects and a restricted access natural park providing educational and recreational opportunities for the public (Appendix M). Figure 6-1 displays the major components of the mitigation package in the Cove. The proposed enhancements to Masonville Cove include tidal wetland creation and enhancement, non-tidal wetland creation, reef and fish habitat creation, shallow water habitat (SWH) improvement, fringe marsh creation, water quality monitoring and habitat assessment, terrestrial habitat enhancement and diversification, and a landside and water cleanup. Additional proposed community enhancements that are included in the mitigation plan are a restricted access nature park with an education center and trails, funding for education and research programs at the nature park, and a conservation easement for the Masonville Cove site. These items are discussed in greater detail in the following sections. Fact sheets for each project are included in Appendix M.

Figure 6-1. Masonville Cove Mitigation and Enhancement Projects

Tidal Wetland Creation and Enhancement – The proposed vegetated tidal wetland creation and enhancement sites are shown in Figure 6-2. There would be 3.1 acres of tidal wetlands created and another 2 acres of tidal wetlands enhanced by placing sand to an appropriate elevation, constructing channels and inlets for hydrodynamic function, and planting of native wetland vegetation. As part of the tidal wetland enhancement, common reed grass (*Phragmites australis*) would be removed. The creation and enhancement of tidal wetlands in Masonville Cove would improve substrate conditions and wetland habitat, increase fish forage and refuge opportunities, and enhance wading bird and waterfowl foraging opportunities. The initial construction cost for this portion of the proposed mitigation is estimated to be $780,300.

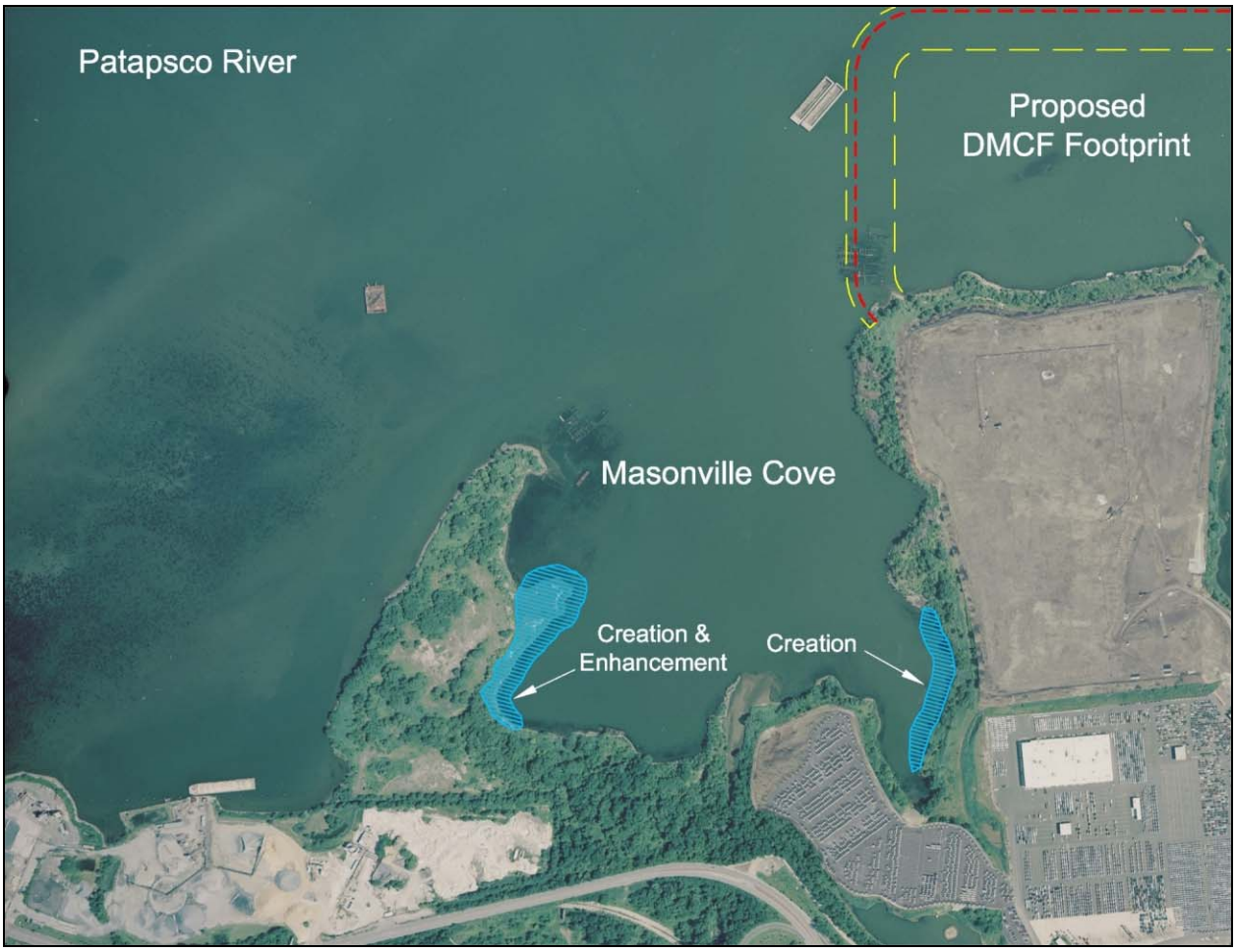


Figure 6-2. Tidal Wetland Creation and Enhancement Sites in Masonville Cove.

Non-Tidal Wetland Creation – The proposed non-tidal wetland creation site is shown in Figure 6-3. The 10 acre non-tidal wetland would be created by excavating existing material to achieve appropriate grades, constructing water level maintenance structures, and planting native wetland vegetation consistent with species recommended by the U.S. Fish and Wildlife Service (USFWS) for wet and moist areas of the Maryland Coastal Plain. The creation of a non-tidal wetland would diversify vegetation and floodplain habitat, provide refuge and forage opportunities for freshwater fish, provide forage areas for wading and shore birds, provide nesting opportunities

for waterfowl species, and provide a freshwater source for birds and terrestrial wildlife. The initial construction cost for this portion of the proposed mitigation is estimated to be $1,000,000.

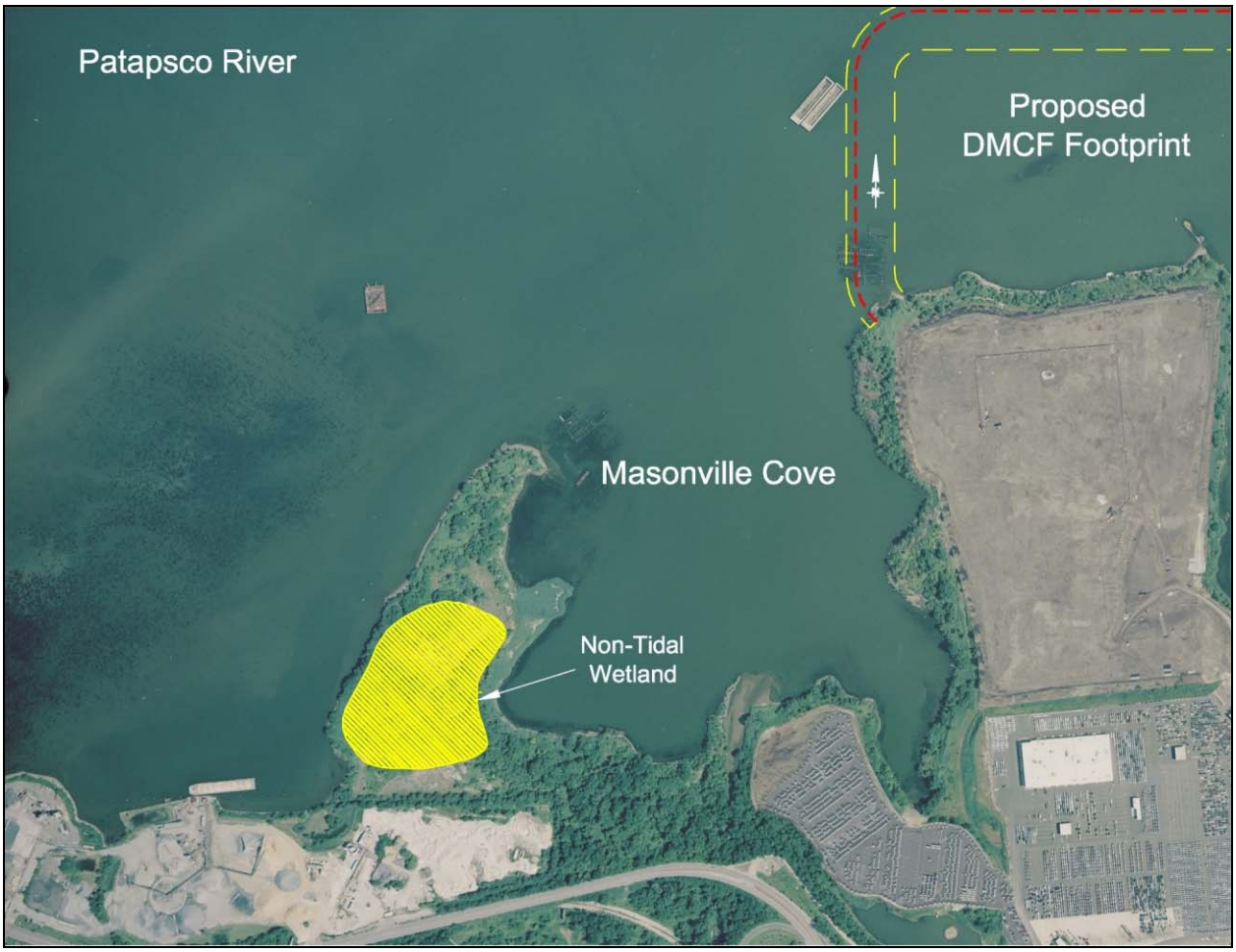


Figure 6-3. Non-tidal Wetland Creation Site in Masonville Cove

Reef and Fish Habitat Creation – The proposed reef and fish habitat creation area is shown in Figure 6-4. The proposed habitat creation area includes 73 acres of waters in and adjacent to the Masonville Cove. Improvement of substrate would occur through the spreading and creating of underwater mounds of sand and gravel and placement of reefballs and rock piles. This would improve substrate conditions, in-stream habitat, and vertical structure, which would then improve benthic conditions and forage opportunities for fish. An increase of in-stream three-dimensional structure would provide additional habitat for epibenthic colonization, cover for aquatic organisms, and substrate for encrusting bivalves. The initial construction cost for the proposed reef and fish habitat creation is estimated to be $2,263,000.

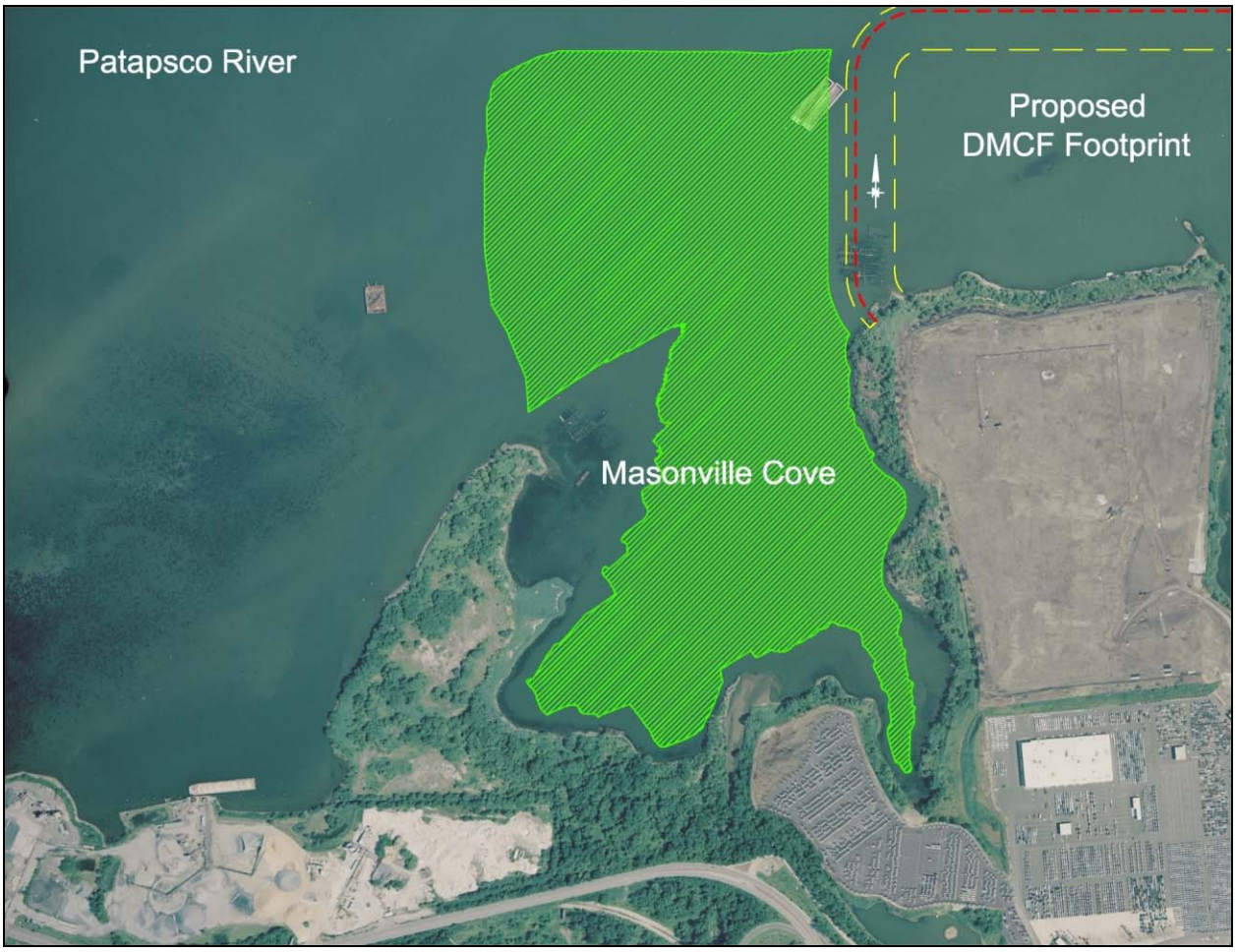


Figure 6-4. Reef and Fish Habitat Creation at Masonville Cove.

Shallow Water Habitat (SWH) Improvement – The proposed SWH improvement areas are located in areas less than two meters deep in and adjacent to Masonville Cove. These areas are shown in Figure 6-5. Debris removal would occur in the proposed enhancement areas and then seven to eight inches of clean sand would be spread across the area, totaling 22.8 acres. The improved substrate should allow aquatic vegetation to spread naturally in the area. The initial construction cost for the SWH improvement is $552,000.

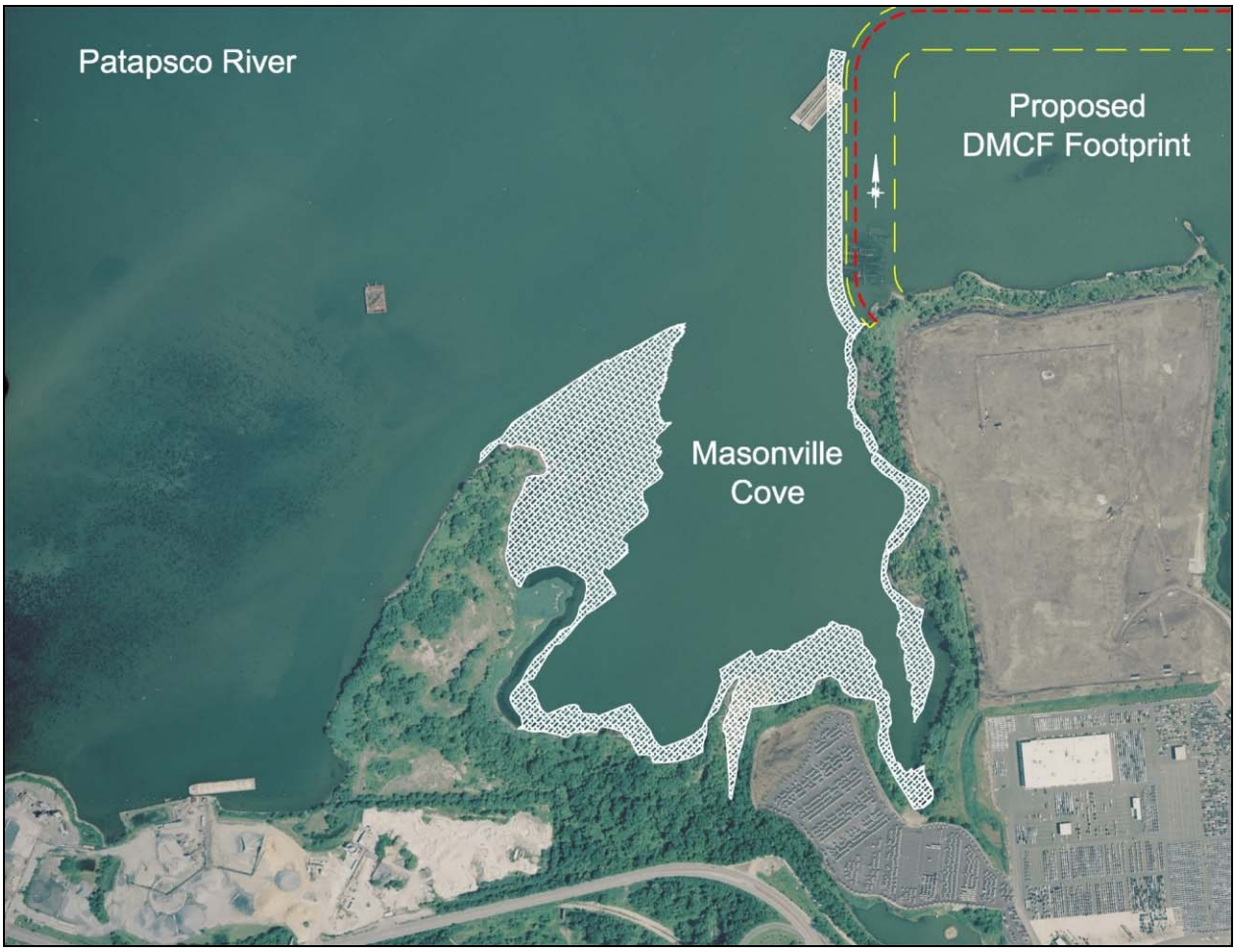


Figure 6-5. SWH Improvement Areas at Masonville Cove.

Fringe Marsh Creation – The proposed fringe marsh creation locations are shown in Figure 6-6. There would be 2 acres of fringe marsh created along the dike of the proposed Masonville DMCF and the shoreline of Masonville Cove. The fringe marsh areas would be 20 ft wide with a slope into the water of 15:1. The proposed fringe marsh creation substrate enhancements would improve benthic conditions and fish foraging opportunities. Improving shore conditions would also provide better habitat for SAV expansion and would provide foraging opportunities for wading birds and shorebirds. The total cost for the proposed fringe marsh creation is estimated to be $189,000.

Figure 6-6. Fringe Marsh Creation in Masonville Cove.

Terrestrial Habitat Enhancement and Diversification – The specific location(s) for the proposed terrestrial enhancements has(have) not yet been determined. The enhancements would occur in an area adjacent to Masonville Cove that is not included in any of the other mitigation options, with the exception of the cleanup. Native plants with good habitat value would be retained and non-native species would be removed. These plantings would be augmented with trees, shrubs, and herbaceous plants recommended by the USFWS for the Maryland Coastal Plain area within the Chesapeake Bay. The proposed enhancement would cover 10 acres adjacent to the Cove. Within these 10 acres, the density and diversity of plants would be improved. This enhancement may provide nesting sites for eagles and also have indirect benefits to in-stream habitat by providing shading and improved shore/bank conditions. The initial cost for terrestrial habitat enhancements and diversification is estimated to be $840,000.

Water Quality Monitoring and Habitat Assessment – A continuous monitoring site would be created in Masonville Cove and would monitor six key habitat components within the Cove every 15 minutes from April to October. Results would be available to the public on-line at www.eyesonthebay.net and at a kiosk in the proposed Masonville Education Center. Additionally, the Maryland Department of Natural Resources (DNR) would install SAV test plots and monitor them for two years. The results from the SAV test plots and the continuous

monitoring site would be used to assess specific locations and the feasibility of a large-scale restoration. This would aid in tracking the progress of restoration projects and assessing the attainment of the new Chesapeake Bay water quality criteria. This data would also serve as an education and outreach tool for the public. The initial construction cost of this option is estimated to be $96,000.

Landside and Water Cleanup – The landside area proposed for cleanup is shown in the shaded area in Figure 6-7; the water cleanup area may include any portion of Masonville Cove. The MPA will conduct a site specific human health risk assessment to define the risk to park visitors. The remedies will include cleanup and removal of trash, tires, and other waste materials. They will also include removal of contaminated materials and the use of institutional engineering/environmental controls to protect human health and the environment. The cleanup would prepare the area for use as a recreational park, and would provide the community with a safe and aesthetically pleasing natural area. The MPA has allocated $2,500,000 for this project.

Note: The shaded area includes all areas that would be considered for landside cleanup.

Figure 6-7. Landside Cleanup Area adjacent to Masonville Cove

Conservation Easement – The proposed conservation easement would cover approximately 50 acres of land surrounding Masonville Cove (Figure 6-8). The conservation easement would prevent the land from being used for any purposes except for environmental education and

related activities in perpetuity. Preservation of the shoreline and terrestrial habitat areas would continue to support the fish and wildlife species known to occur there as well as protect any future habitat improvements and fish and wildlife utilization.

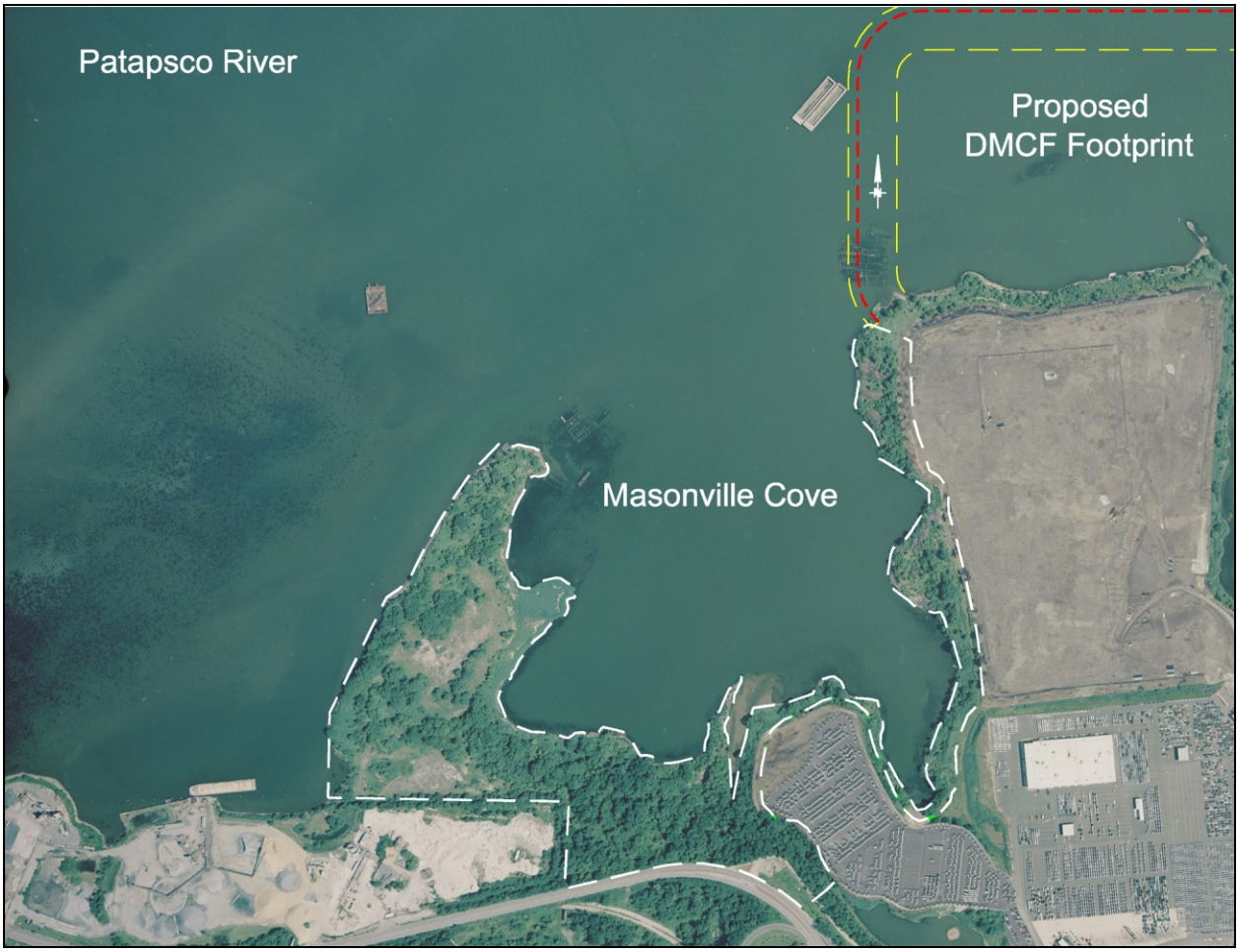


Figure 6-8. Location of the Proposed Conservation Easement.

Masonville Environmental Education and Nature Center and Hiking and Biking Trails Allocation – There would be a 30 ft by 40 ft, two-story facility with 700 ft^2 of deck, 1,500 ft of handicapped trail access to the water's edge, and possibly an additional 8,300 ft of trails (Figure 6-9). The construction of an environmental education and nature center would provide the Brooklyn and Curtis Bay communities with their closest access to the water. There would be environmental education programs for school children and the community. A kayak and canoe pier would connect the Cove to the Chesapeake Waterways program. The proposed hiking trails would have environmental signage. The MPA would fully fund this portion of the mitigation package, which is estimated (at this time) to cost $750,000.

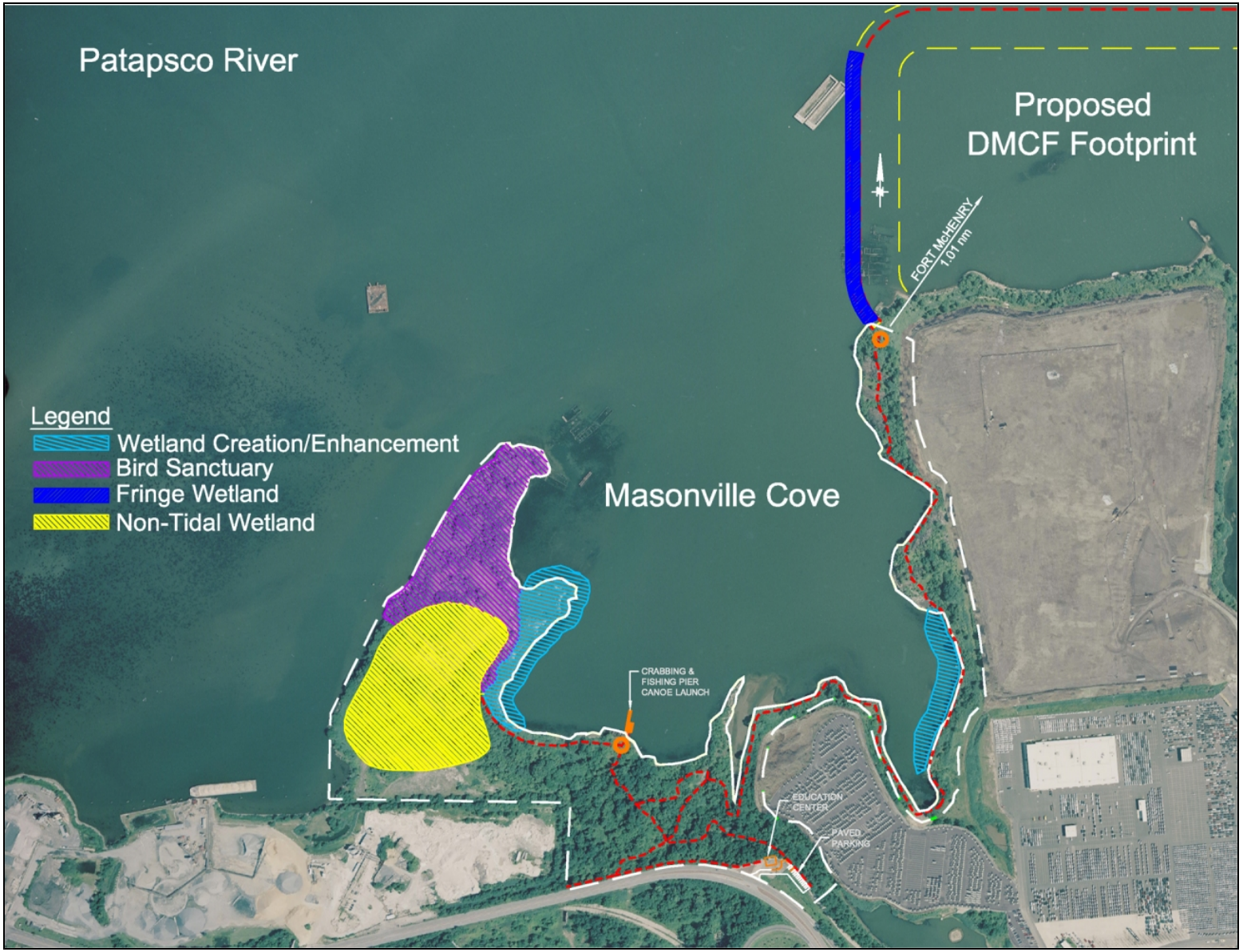


Figure 6-9. Proposed Masonville Environmental Education and Nature Center with Hiking and Biking Trails

Masonville Cove Education and Research Allocation – The proposed education and research would be conducted from the proposed Masonville Environmental Education and Nature Center (Figure 6-9). The education center at Masonville Cove provides an opportunity to combine citizen involvement, public awareness, education and research while providing valuable information on water quality and mitigation success. The project would use trained volunteers to collect scientifically valid data, which would increase the monitoring effort by including more sites for a longer period of time. The goal of this program is to improve design and understanding of how created tidal wetlands function so that future mitigation sites, particularly those in urban areas, achieve a higher degree of success. A total of $500,000 would be allocated for this effort.

6.2 ACCESS TO THE MASONVILLE COVE FACILITIES

The MPA's goal is for the Nature Center to be accessible by vehicles, buses, bikes, and pedestrians. There would be a parking lot off of west bound side of Frankfurst Avenue. The MPA would approach MDOT and provide the additional bus stop at or near the site. Figure 6-10 shows the MPA's proposal for a sidewalk leading from the traffic light at the intersection of Frankfurst Avenue and Hanover Street. This sidewalk would provide access to the Masonville Cove for citizens from the community. Citizens would be able to pass under the railroad and 895 along Hanover Street, cross to the north side of Frankfurst Avenue at the Hanover St and Frankfurst St intersection where there is a traffic light, and proceed approximately 0.5 miles along the proposed sidewalk to the Masonville Cove. The sidewalk would also provide a link to the Gwynn's Falls Trail system (Figure 6-10). The Gwynn's Falls Trail system extends from Harbor Hospital, down Potee Street via a bike lane to the stoplight at the intersection of Hanover Street and Frankfurst Avenue. This traffic light is the starting point for the proposed sidewalk.

Figure 6-10. Access to the Masonville Cove Facilities

6.2.1 Off-site Mitigation Projects

American Eel Passages – This mitigation project was recommended by Maryland DNR. The locations of the proposed eel passages are shown in Figure 6-10. The proposed enhancement would construct specialized passages designed to accommodate eels at each of the dam locations. These would allow eels to continue their upstream migration and it would reopen a substantial amount of habitat. Maryland DNR would be developing the project, but it would be funded by MPA. Maryland DNR would be responsible for maintaining this project into perpetuity. The total cost is estimated to be $420,000.

Eels ascend freshwater environments as juveniles. These fish reside in riverine habitats until reaching maturity, at which time they migrate to the Sargasso Sea in the Atlantic Ocean, where they spawn once and die. Larval eels are transported by ocean currents to rivers along the eastern seaboard of the continent. Historically, American eels were very abundant in East Coast streams, comprising more than 25 percent of the total fish biomass in many locations. This abundance had declined from historic levels but remained relatively stable until the 1970s. Eel densities in surveyed tributaries have decreased since the 1980's and continue to decline. On July 6, 2005, the USFWS decided to review the American eel for possible listing on the endangered species list. Bloede dam is the first blockage on the Patapsco River that prevents

American eel from accessing the nearly 300 square miles of watershed above the dam. Data collected by the Maryland Biological Stream Survey (MBSS) reveal that Bloede dam is a major barrier to eel migration (Figure 6-11). Fish passage was constructed at the dam in 1991 but was designed for shad and herring and is ineffective for eel passage. Simkins Dam and Daniels Dam located 0.5 and 7 miles upstream of Bloede Dam also prevent American eel from reaching upstream habitat. Work at Daniels Dam assumes the removal of or the existence of an effective eel passage at Union Dam.

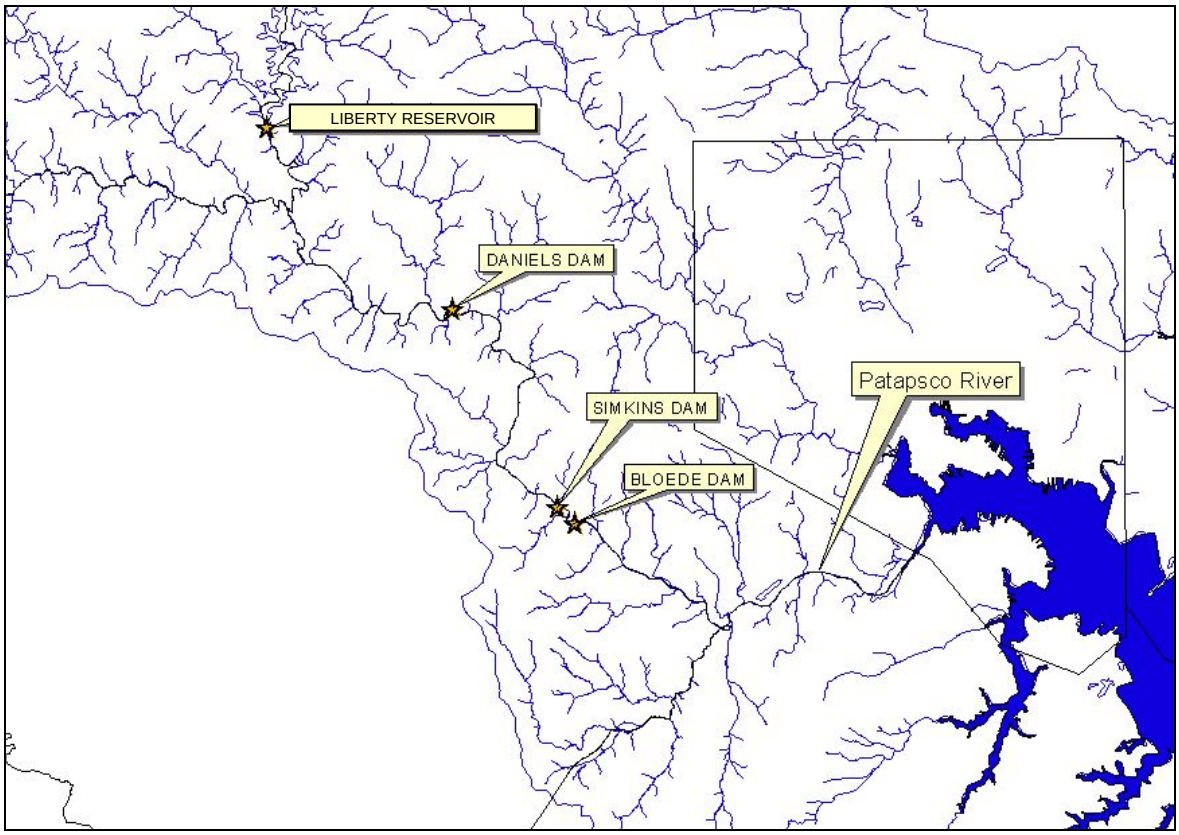
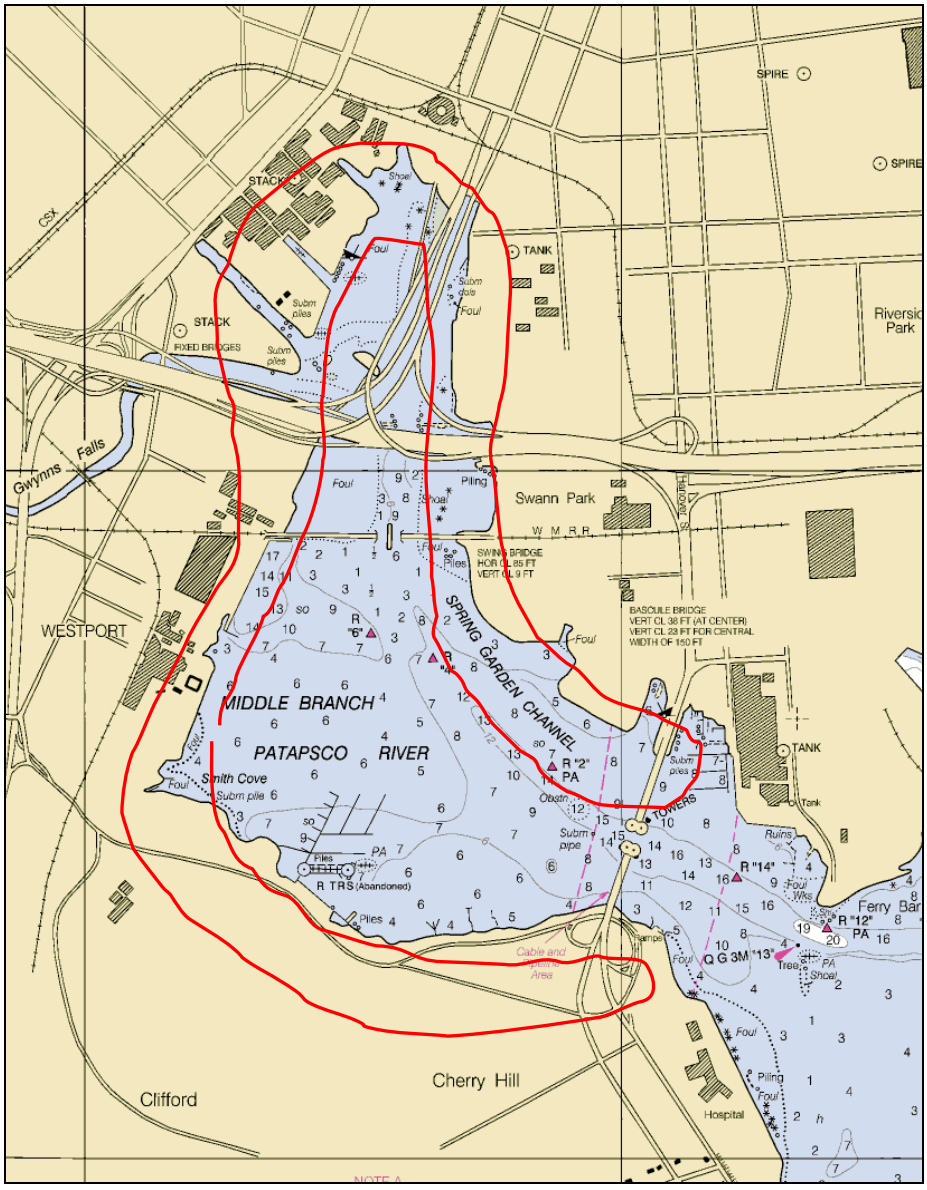


Figure 6-11. Proposed Locations for Eel Passages on the Patapsco River.

Shad and Herring Restoration – The proposed anadromous species restoration would be conducted in the mainstem of the Patapsco River from Ellicott City, approximately two miles above the Simkins Dam down to the mouth of the River (Figure 6-11). American shad (*Alosa sapidissima)*, hickory shad (*Alosa mediocris*), blueback herring (*Alosa aestivalis*), and alewife (*Alosa pseudoharengus*) would be produced, marked and stocked in the Patapsco River. Blueback herring and alewife would be stocked as larvae and juveniles. The abundance and mortality of larval and juvenile shad and herring would be monitored using marked hatchery-produced fish. The contribution of hatchery fish to the adult spawning population would be estimated and the recovery of naturally produced stocks would be monitored. Stocking and monitoring would be completed by the Maryland DNR, and funding would be provided by the MPA. The hatchery inputs would provide adult spawners that would produce self-sustaining populations in the Patapsco River. Restoration of these species would fill an important niche in the Chesapeake Bay ecosystem. The stocking and culture costs of this project for three years are estimated to be $450,000.

Trash Interceptors – The area in which the proposed trash interceptors may be placed is shown in Figure 6-12. The exact locations of the trash interceptors would be determined based on the input of the Joint Evaluation (JE) Committee if this portion of the mitigation package is approved. The project would include construction of a trash interceptor at five outfalls in the Middle Branch of the Patapsco River. The trash interceptors would consist of a netting system to catch trash and debris prior to it entering the Middle Branch. The interceptors would be emptied regularly and the trash material would be disposed of as municipal waste. Removal of debris and trash increases the survivability of wetlands in the watershed, reduces future buildup of debris along shorelines, and provides aesthetic benefits to the community. The initial cost for this project is estimated to be $2,500,000.



Note: The area that will potentially contain trash interceptors is outlined in red.

Figure 6-12. Area Where Proposed Trash Interceptors May be Installed

6.2.1.1 Impacts

The Masonville Cove cleanup and improvements are expected to benefit both the ecological system as well as the community. Cleanup of the terrestrial areas around the Cove would remove a substantial amount of debris and trash and would improve the aesthetics, health, and safety of the area. The soils adjacent to Masonville Cove would require remediation to meet residential soil standards, because the enhancements to the area include the creation of an environmental education and nature center and an educational trail system. This may result in a net improvement in soil quality in some areas. The current vegetated buffer consists of opportunistic plants of marginal ecological value. Mitigation and improvement plans include planting of native species to improve habitat quality. Indirectly, this would provide better habitat for terrestrial resources including pheasants, deer, raptors, and songbirds. Current enhancement plans include a 10-acre non-tidal wetland creation project. Very few non-tidal wetlands of substantial size exist within Baltimore City or along this reach of the Patapsco River and this would constitute a significant improvement to the watershed. Table 6-1 summarizes the mitigation impacts.

Table 6-1. Mitigation Acreages for Proposed Masonville DMCF

Type of Habitat Created, Enhanced, or Improved	Total Acres
Vegetated Tidal Wetlands Created	3.1 acres (1.5 + 1.6 acres)
Vegetated Tidal Wetlands Enhanced	2.0 acres
Vegetated Nontidal Wetlands Created	10 acres
Fringe Marsh Creation	2.0 acres
Total Wetlands Created or Enhanced	***17.1 acres***
Shallow Water Habitat Improved/Enhanced	22.8 acres
Terrestrial Habitat Enhancement	10 acres
Landside and Water Cleanup (shoreline of Masonville Cove)	25 acres
Underwater Reef and Fish Habitat Improved/Cleaned Up (inner and outer Masonville Cove)	73 acres

It is important to note that if the no action alternative were implemented, none of the proposed mitigation projects or community enhancements would be completed. Some contaminated materials would remain onsite.

Water and Sediment Quality

Native vegetation would be planted along the shoreline of Masonville Cove which would anchor soil in place, minimizing erosion. Tidal wetlands would be created and enhanced along the shoreline and would slow runoff, absorb pollutants, and minimize the addition of contaminated sediment, nutrients, and pollutants into Masonville Cove.

Aquatic Species and Habitat

Aquatic improvements to Masonville Cove include cleanup of large in-water debris, tidal wetlands creation and enhancements, substrate improvements to protect/enhance SAV and benthic conditions, softening of shorelines and installation of fringe marsh habitat, and fish reef installation (reef balls, rock and sand mounds). Directly, this would improve the benthic condition and fish habitat in the immediate area. The south shore of the Patapsco River is known to be an important nursery area for anadromous fish. Therefore, the reefs are being designed to improve in-stream refugia for the species known to utilize the area. Indirectly, this is expected to stimulate fish stocks within the Patapsco River as well as improve recreational fishing opportunities in this part of the Baltimore Harbor. Any improvement in fish abundance would have secondary benefits to predatory birds such as raptors, herons/egrets, and some diving ducks. The fringe marsh areas and adjacent tidal flats would provide forage areas for wading birds and shorebirds and would provide shallow refugia for smaller fish species.

The substrate enhancement of 73 acres within inner and outer Masonville Cove would allow for a healthier and more diverse benthic community and improve habitat for filter feeding organisms, such as mussels. The hard substrates that would be installed in the Cove would provide attachment areas for encrusting fauna such as platform mussel, barnacles, and possibly oysters. Bivalves (mussels and oysters) are filter feeders and would help to improve water clarity within Masonville Cove. Water clarity improvements would have a secondary benefit to SAV in the immediate area. These substrate enhancements would also benefit smaller forage species that prefer oyster reef or gravel substrates, which are currently limited in the Baltimore Harbor, and young of commercially harvested finfish and blue crabs, which would have long-term beneficial impacts on commercial fisheries in the area. Substrate improvements may also promote SAV expansion within Masonville Cove, which would improve fish foraging areas.

The substrate enhancements include the installation of reef balls and mounding of sand, which would increase the amount of in-stream refugia and ultimately benefit predatory species, such as white perch and striped bass, which are known to utilize the area. These substrate and habitat improvements also include the enhancement of 22.8 acres of SWH. The enhancement of the SWH would include the removal of embedded debris and placement of sand. There may be increased turbidity or other adverse affects to SAV while in-water work associated with the mitigation projects is completed. Despite increased sedimentation and a potential increase in turbidity from the operation of the proposed Masonville DMCF, the proposed enhancements to Masonville Cove are expected to have a long-term beneficial impact on SAV, the benthic community, and fish species. As previously noted, SAV expansion would provide additional forage and refuge opportunities for aquatic species.

The positive impacts associated with fisheries and commercial fisheries are described in more detail in the recreation section of this chapter.

Wetland Habitat

The mitigation projects would result in the creation of approximately 3.1 acres of tidal wetlands, the enhancement of 2 acres of tidal wetlands, the creation of a 10-acre non-tidal wetlands, and

the creation of 2 acres of fringe marsh. Wetland areas provide both habitat and food sources for avian and mammal species, as well as nesting areas for avian species. The creation of tidal wetland habitat within Masonville Cove is likely to include the creation of some intertidal benthic habitat, although these tidal wetlands would probably not support the same benthos as a tidal open water substrate habitat. It is assumed that the creation of wetland habitat would not be comparable to the amount of permanently lost habitat due to the proposed alignment because the created wetland would be higher in elevation, and therefore not adequate for the species that currently inhabit the benthic area within the proposed alignment.

Wetland areas within Masonville Cove have the potential to improve water quality within the Cove by trapping sediments and slowing runoff before it enters the water. The enhancement and creation of tidal wetlands along the shoreline of Masonville Cove would also act as a buffer to prevent nutrients and pollutants from entering the water in runoff. Buffering against nutrient loading would minimize the possibility of phytoplankton blooms in Masonville Cove. This improved water quality could have a secondary positive impact on the benthic community within the Cove.

Avian Species

The Cove improvements include extensive debris removal and native plantings, which should encourage use of the area by bald eagles and other species of concern, such as hooded mergansers. Improvements to water quality and fish habitat would improve forage opportunities for many avian species, especially raptors (like the bald eagle) and waterfowl. The mitigation projects also include the creation of a 10-acre bird sanctuary, which would provide food sources, nesting sites, and shelter for avian species.

Terrestrial Species and Habitat

All of the proposed compensatory mitigation for the proposed Masonville DMCF slated to occur adjacent to Masonville Cove would occur within the State-designated critical area. This portion of the mitigation package includes a cleanup, which would remove debris and pollutants from the area. Due to the requirement for management and removal of the waste materials, destruction of much of the existing, but degraded habitat, may occur. There would be debris removal (approximately 25 acres) and backfill with clean fill to support terrestrial vegetation. Ten acres of terrestrial habitat, including the surface soil, would be enhanced, which is expected to have a long-term, beneficial impact to the soils in the area and habitat diversity in the area. The MPA would be responsible for all costs associated with the remediation of soils. It is expected that terrestrial improvements would have a long-term beneficial impact to wildlife living in Masonville Cove.

Child Health and Safety

Currently, conditions in Masonville Cove are unsafe. Large amounts of debris along the shoreline and in the water make this area treacherous. Additionally, environmental contaminants may be present, but their levels are currently unknown and testing is continuing. The intent of the enhancement projects is to improve these conditions for the health and safety of the

community. Precautions would be taken at Masonville Cove to minimize the risk of potential hazardous conditions presented by the water or beaches to users. At a minimum, the same safety measures would be implemented at Masonville Cove that are taken at State controlled parks and reservoirs where swimming is prohibited.

At the State Parks, the Department of Natural Resources follows the guidelines of the U.S. Lifesaving Association (USLA 2005). Specifically, Maryland DNR prepares a "beach management plan" for designated locations, including water bodies where swimming may appear attractive but is prohibited for health or safety reasons (attractive nuisances, such as the fringe marsh and other shoreline access areas). The standard management practices to safeguard the public are signage, education, and surveillance conducted either by personnel or by remote security cameras. At the Cove, it would be important to convey the reasons why swimming is prohibited through signage and other means.

Currently, environmental education programs by the National Aquarium in Baltimore and the Living Classrooms Foundation are planned for the Cove. Each of these organizations has standard operating procedures to ensure the safety of participants. It is intended that these operating procedures would be implemented for the activities and programs conducted at Masonville Cove.

In the event that Residential cleanup standards are not met Cove-wide, access would be allowed only in those areas deemed safe. Therefore, no additional health and safety risks are anticipated.

Recreation

With the proposed project and the integrated compensatory mitigation project in Masonville Cove, the Cove and surrounding waters could become a draw for non-motorized boat users. Even with an increase in the number of non-motorized boat users, the previously mentioned decrease in distance between the shoreline and the shipping channel is not anticipated to have an adverse affect on recreational boaters. Non-motorized boats, such as canoes and kayaks, should be able to safely navigate within 400 ft of the shoreline. Among the enhancements currently being considered that may attract paddlers are a canoe/kayak launch, nearby parking, and debris cleanup. Such enhancement would provide enhanced recreational access to residents and visitors.

The proposed environmental enhancements in Masonville Cove may improve recreational fishing in the area by improving water quality and fish habitat on a local scale. The Cove enhancements also include a small pier that would be suitable for angling and would be an additional enhancement to recreational fishing in the area.

Implementation of the proposed integrated, compensatory mitigation in Masonville Cove could significantly improve habitat and public access, thereby enhancing wildlife viewing opportunities. Current use of Masonville Cove by wintering waterfowl and recreational birders was discussed in the Existing Conditions chapter (Section 2.4.2). Wintering waterfowl are found inside the Cove until it ices over (Ringler 2005); therefore construction of the proposed DMCF is not expected to spatially overlap with the area used by the overwintering birds. Environmental

enhancement in the Cove may increase birding opportunities by improving habitat conditions, thereby increasing the likelihood that species of interest would use the site. In addition, the enhancements would improve public access to the site through parking facilities, nature trails and observation towers, allowing greater numbers of recreational users to enjoy birdwatching at the Cove.

Mitigation in Masonville Cove would provide new recreational opportunities to residents. In addition to the enhancements mentioned under boating and wildlife viewing, the potential Cove enhancements include an environmental education and nature center and numerous proposed restoration and cleanup activities. These projects have the potential to provide additional beneficial recreational opportunities for residents of nearby areas such as walking, picnicking, and other activities.

The educational trails and environmental education and nature center proposals were conceived with community input and are being designed specifically to improve community access to Masonville Cove and to improve ecological recreation and educational opportunities in the Brooklyn-Curtis Bay area. The local residents of this area could directly benefit from these opportunities. Indirectly, the project may stimulate community involvement and environmental stewardship in the Masonville area.

6.3 JUSTIFICATION OF THE WETLAND MITIGATION PACKAGE

Documenting that the losses associated with the fill at Masonville are offset by the proposed mitigation projects is important to justifying the level of compensation of the mitigation plan. Initially, a secondary productivity analysis was conducted, patterned after a similar effort for the Craney Island open water mitigation assessment. Due to a lack of site-specific data for secondary productivity in the area, the modeling had to draw from published sources. The results were evaluated by local resource agencies represented on the JE Committee and the BEWG. Reviews of the model generally concluded that without site-specific data, the productivity model was likely over-estimating some of the losses and the gains. It was also generally recognized that due to limitations inherent in estimating secondary productivity losses and gains, that initial assessment was unable to incorporate benefits associated with many of the proposed mitigation options such as the increases in fish biomass associated with the Reef Balls, eel passages, and shad and herring restoration or the overall ecosystem benefits of trash interceptors.

A second evaluation technique was employed that generally followed the NOAA Habitat Equivalency Analysis Approach. Habitat Equivalency generally makes assessments of the values and functions lost due to various environmental perturbations and gained through mitigative measures. For the Masonville mitigation, a project-specific Habitat Condition Analysis was developed which includes a multi-metric evaluation of the open water impacts and the benefits of the mitigation options based on standard measures of ecological value. The condition factors derived for the analysis come from standard regionally- appropriate and broadly-accepted measures of environmental quality. These ecological measures are assigned to a standard scoring scheme.

The condition factors used for this analysis are included in Table 6-2. Because the Chesapeake Bay Benthic-IBI and the standard fisheries community assessment scoring schemes are already scaled on a 1 to 5 basis, a value between 1 and 5 was chosen as the scoring scheme for all metrics. The definitions for each scoring level were taken verbatim from the literature, where they existed, or assigned based upon the best professional judgment of the project researchers. The definitions were presented to the local resource agencies represented on the JE Committee and the BEWG and no alterations in scoring scheme were requested. Some input was received on the final condition factors for individual mitigation options and these have been integrated into the current version of this analysis.

To conduct the actual evaluation, an initial and final condition factor is assessed for the impacted area and the proposed mitigation options. The difference between the initial and final condition is then scaled by the amount of acreage affected to yield the amount of compensation needed for the affected area. For this analysis, it was termed "mitigation credits." The credit calculation is then completed for each of the mitigation options and the offsets from the mitigation options are balanced against the calculated loss Table 6-3. For some options, such as fish restoration and trash interceptors, there are no acreage values. In these instances, acreage-equivalents were derived based on the $75,000 per acre Maryland wetlands compensation value.

From the first line on Table 6-3, the initial condition of the Masonville footprint is assessed to be approximately 1.7 based on an average benthic condition of 2.5 and average sediment quality conditions of 1 (based on the condition factor definitions in Table 6-2). The final condition of the area is considered zero, because it is a total loss of function. The impacted in-water area would be 131 acres. Scaling this acreage by the -1.7 loss of condition yields a need to mitigate for 223 "mitigation credits." As an example, the second line in Table 6-3 assesses the wetland enhancement option. The current wetlands in Masonville Cove are dominated by Phragmites and have poor hydraulic conditions; they were assessed to have an initial condition factor of 2. With Phragmites control and regrading, it is expected that could be improved to a condition of approximately 3.5. The improvement in condition factored over the 2-acre area yields a "mitigation credit" of 3, which is subtracted from the total loss of 223. The justification for the initial conditions was based on actual field data for the sites and is included in the comments on the table.

This process is repeated for each option in sequence. The mitigation balance column of Table 6-3 accounts how each option offsets the remaining wetlands credits needed. Based upon this analysis, all of the mitigation credits needed to compensate for the open water losses at Masonville are realized by the aquatic options. This is the point in the table where the mitigation credit balance column becomes positive. It is estimated that the aquatic projects generate approximately 32 mitigation credits in excess of those needed to compensate for the open water loss.

Table 6-2. Existing Conditions at the Masonville Site

	Condition				
	POOR →				IDEAL
	(Eutrophic backwater)				(Barren Island)
Indicator or Feature	1	2	3	4	5
B-IBI	Severely degraded (poor abundance & diversity)	Degraded	Fair (meets restoration goals)	Good	Excellent (good diversity; stable community)
Fish (community)	Little or no fish;	Poor diversity; abundance in one species	Moderate diversity & abundance	Good diversity; abundances across several species	High diversity and good abundances in all seasons
Fish (population)	Populations not sustainable; on verge of extirpation	Population marginally sustainable; poor recruitment relative to available habitat	Population struggling with wide variations in recruitment success	Population strong; recruitment successful in most years	Population fully sustainable and at full carrying capacity for available habitat.
Contaminants	Many exceed ERM; some more than 2X	Several > ERM; many >PEL or ERM-Q	Some exceed PEL or ERM-Q; many greater than TEL	Several greater than TEL; few other exceedances	Few or none >TEL
Aquatic Habitat (estuarine)	No Cover; Bulkheaded; Poor WQ & forage	Little Cover; Low DO Seasonally; degraded forage	Moderate Cover; some SAV; DO usually supportive; adequate forage	Good Cover; soft shorelines; SAV present; good DO; stable forage	Diverse cover; Stable SAV; good DO; abundant forage in all seasons.
Aquatic Habitat (stream)	Highly entrenched; very low width to depth ratio; low sinuosity; riffles highly embedded; poor instream cover and benthic habitat	→	→	→	No entrenchment, width to depth ratio very high; high sinuosity; little riffle embeddedness; excellent instream cover and benthic habitat
Wetland and Riparian vegitation	Dominated by pioneer or invasive species; lots of human debris	→	→	→	Dominated by stable balanced communities of Natvie species; liitle trash or debris

Note: To the extent possible, these definitions follow standard ecological measures for sediment quality, WQ, B-IBI, etc.
The general approach is a multi-metric scoring technique following the IBI work of Karr others.
The benthic, stream & esturaine habitat and fisheries community definitions are derived from various published multi-metric approaches.

Table 6-3. Habitat Condition Analysis for the Proposed Masonville DMCF Mitigation Package

Item #		Description	Quantification	Habitat Condition Changes		Item Mitigation Credits	Mitigation Credits Balance	Notes on Existing Condition
			Acres or Acre equivalents*	Initial Condition (score 1-5)**	Final Condition (score 1-5)**	(Final condition-Initial condition) X acres		
		IMPACTED AREA	**131**	**1.7**	**0**	**-223**	**-223**	Initial condition of 1.7 X 131 acres (130 open water and 1 veg. wetlands)
MITIGATION OPTIONS: Aquatic Projects								
1		Wetland Enhancement	2.0	2.0	3.5	3.0	-220.0	Current wetlands dominated by Phrag.
2		Wetland Creation	3.1	2.0	4.0	6.2	-213.8	Shallow areas with little-to-no vegetation
3		Non-Tidal Wetland	10.0	1.0	4.0	30.0	-183.8	Non-tidal area not currently a wetland. Devoid of plants and/or dominated by pioneer species
4		Reef and Fish Habitat (subtotal)	95.8					Fish community current conditions: outside cove are 2 (poor diversity with abundance in single species); Current conditions inside cove (shoreline) are a 4 (good diversity with abundance across several species).
	a	*Reef Balls and Fish Habitat (Inner Cove)*	31.0	3.5	4.0	15.5	-168.3	Some instream cover (artificial), natural shoreline and SAV present
	a	*Reef Balls and Fish Habitat (Outer Cove)*	42.0	2.0	3.0	42.0	-126.3	Little cover and poor substrates and benthic conditions
	b	*Shallow Water Substrate Improvement*	22.8	2.5	3.0	11.4	-114.9	Benthic conditions poor in some shallower parts of Cove; much debris
5		Fringe Wetland Creation (along dike)***	2.0	2.0	4.0	4.0	-110.9	Current beaches small with little natural cover and poor substrates
6		Eel Passage (Bloede/Simpkins Dam, Daniels Dam, Sawmill Creek, Deep Run)	**5.6**	2.0	4.0	11.2	-99.7	The populations of herring/shad and and eels in the Patpasco drainage are at record low levels and sustainability is questionable.
7		Shad and Herring Restoration	**6.0**	2.0	4.0	12.0	-87.7	
8		3 Trash Interceptors	**20.0**	1.5	3.0	30.0	-57.7	Abundant trash which is a large problem for habitat quality.
9		Biddison Run Reach O (3039 linear feet of stream)	**6.1**	1.5	4.0	15.3	-42.5	Poor channel stability and instream habitat
10		Biddison Run Reach P (5700 linear feet of stream)	**14.0**	2.0	4.0	28.0	-14.5	Poor channel stability and moderate instream habitat
11		2 trash Interceptors	**13.3**	1.5	2.5	13.3	-1.2	Abundant trash which is a large problem for habitat quality.
12		Western Run (6 reaches, totalling 4758 linear feet of stream)	**15.2**	1.8	4.0	33.4	**32.3**	On average, poor channel stability and poor to moderate instream habitat
MITIGATION OPTIONS: Aquatic Related Projects								
13		Water Quality Monitoring in and Habitat Assessment in Masonville Cove	**1.3**	2.0	2.5	0.7	**32.9**	No monitoring currently. DNR and education program will benefit.
14		Landside and Water- Phase I Cleanup****	3.3	1.5	3.5	6.5	**39.4**	Tremendous amount of Debris in water and wetlands presently. Approximately 13% aquatic.
MITIGATION OPTIONS: Non-Aquatic Projects								
15		Terrestrial Habitat Enhancement and Diversification	10.0	1.5	3.5	6.0	**45.4**	Area filled with debris, trash and waste; plants predominantly pioneer species. Credit scaled down by 2/3 to reflect credit for the approximate extent of the critical area only.
16		Education Center/Trails (Allocation)	1.0	2.0	2.1	0.1	**45.5**	Surrogate score. Little credit taken for this category.
17		Education / Research (Allocation)	1.0	2.0	2.5	0.5	**46.0**	No education currently. Education targeted at Envir. Improvement
18		Conservation Easement (Approximately 50 Acres in Easement)	25.0	2.0	2.1	2.5	**48.5**	Surrogate score. Little credit taken for this category.

In order to capture the benefits of the aquatic related and non-aquatic options and account for all mitigation in this analysis, assessments were made for all options, to the extent possible. For these "other" options, scaling was applied to focus the benefit only on the aquatic portion of the option and in cases, like the education elements, very little credit was taken (Table 6-3). The overall assessment, including all options, indicates that approximately 48 mitigation credits, beyond those needed to compensate for the loss, would be generated by the mitigation package.

6.3.1 Mitigation Monitoring

It is expected that monitoring would be required to assess the success of most of the proposed mitigation projects. The monitoring plans would be developed as part of the mitigation package as part of the approval process by the USACE. The following sections describe potential goals and requirements of the long-term monitoring and maintenance of the mitigation sites.

- **Tidal Wetland and Enhancement:**
    - To ensure successful establishment of target vegetative species, including development of subsurface root-rhizome systems
    - To eradicate exotic and/or invasive plant species
    - To ensure proper hydrologic functioning of established wetlands
    - To document wetland use of fish and benthic invertebrates

- **Non-Tidal Wetland Creation:**
    - To ensure successful establishment of targeted vegetative species
    - To eradicate exotic and/or invasive plant species
    - To ensure proper hydrology has been established

- **Reef and Fish Habitat Creation:**
    - To determine fate of placed sandy material
    - To evaluate fish use and fouling community colonization of reef structures

- **Fringe Marsh Creation:**
    - To determine fate of placed sandy material
    - To evaluate fish and invertebrate use

- **Water Quality Monitoring:**
    - To maintain monitoring equipment and facilitate availability and use of data

- **Eel Passages:**
    - To maintain eel ladders, correct malfunctions, and appraise their use by target species

- **Shad and Herring Restoration:**
    - To monitor return of stocked progeny to Patapsco River
    - To evaluate use of existing fish ladders by stocked progeny

- **Trash Interceptors:**
    - To determine effectives of trash interceptors
    - To develop a long term maintenance plan

6.3.2 Long-term Maintenance of Mitigation

The objective of the Clean Water Act is to restore and maintain the chemical, physical and biological integrity of the Nation's waters. A primary goal is that there is no net loss of acreage, function and values for compensatory mitigation accomplished for impacts to aquatic resources. The MPA will allocate funds for maintenance. This trust fund/in-lieu fee may be responsible for implementation and success of long-term maintenance of approved mitigation proposals and the repair and remediation of mitigation projects that are unsuccessful.

6.4 CRITICAL AREA MITIGATION

The Chesapeake Bay Critical Areas Commission was created by the Critical Area Act in 1984. The Code of Code of Maryland Regulations, Title 27; and the Annotated Code of Maryland, Natural Resources Article, Title 8, Subtitle 18 contain the specific regulations of the Critical Area Act.

Disturbance to the Critical Area Buffer will occur during various phases of the life of the facility. Construction of the cofferdam, dikes, relocation of storm drains and waterline and placement of dredged material will impact the critical area. Construction project will create 14.1 acres of new critical area buffer in what is currently open water. Ultimately, the only portion of the new buffer that will not be vegetated is the 2.7 acres of cofferdam. The 2.7 acres that will not be planted will be mitigated. Approximately 14 acres of the existing 100 ft critical area buffer will be impacted during site construction and operation. All of the required mitigation is proposed to occur at Masonville Cove or at Masonville Terminal. A total of approximately 45 acres of plantings are proposed for the critical area mitigation. Figure 6-13 shows the locations of the critical area mitigation.

Figure 6-13. Location of Critical Area Mitigation Projects

Details of the critical areas mitigation are included in Appendix M.

6.5 AIR CONFORMITY MITIGATION

Based on result as shown in Section 5.1.8**,** NOx emissions are observed to be above the Federal Conformity limits for the second and third years of construction for the proposed Masonville DMCF construction project. Due to this exceedance, according to the General Conformity ruling [40 CFR 93.158 (a)(2) and (a)(4)], mitigation or an offset of the NOx emissions resulting from construction activities to zero for those years (2007 and 2008) would be required. The full conformity analysis and draft federal conformity decision are available in Appendix K. The final conformity decision will be released with the Record of Decision (ROD).

6.5.1 Background

The first approach pursued to develop an emissions mitigation program was to identify NO_x emission reduction opportunities at all MPA facilities. Several possibilities were examined, such as the electrification of gantry cranes at the Dundalk Marine Terminal, however none were deemed cost

effective or practical in terms of the Masonville project schedule (Appendix N), and pursuant to USEPA guidance emission reduction "projects" should occur at the same time new emissions are generated.

Another option considered was securing permanent emission reduction credits (ERC). Several options in this regard are presently being pursued. One opportunity would be to obtain NOx credits for the necessary 2 year period from Sempra Generation. They have secured the necessary credits, but do not need them until 2009. Discussions are ongoing between the State of Maryland and Sempra Generation. These credits from Sempra Generation are from the Baltimore non-attainment region. Discussions were held with the Maryland Department of the Environment (MDE) to determine if other options would be available for securing emission credits if these emissions credits cannot be secured or would not be a viable means to reduce emissions. The MDE conveyed that a precedent does exist for offsetting NOx emissions with VOC emission reductions under the non-attainment provisions of the State's New Source Review (NSR) Program. The program has been approved by the USEPA and is included in the State Implementation Plan (SIP). The NSR program regulates major new or modified stationary sources of air pollutants that require emission offsets. Since NOx and VOC are both precursors of ground level ozone, the state has allowed the interchanging of emission credits. The MDE would likely consider this substitution for the Masonville project.
Discussions were held with both the MDE and the USEPA to determine whether out-of-State VOC credits could be used rather than securing in-State credits. It was determined based on feedback from the MDE that mitigation credits must be received from the same non-attainment region, in this case the Baltimore region.

6.5.2 Recommended Emissions Mitigation Package

Based on the above alternatives, the proposed approach for mitigation would be to purchase approved NOx credits from Sempra Generation. There are 250 tpy of NOx credits from the Baltimore non-attainment region available from Sempra Generation. These credits would be sufficient to offset the emissions generated from the construction of the proposed Masonville DMCF under either borrow scenario, as described in previous chapters. These credits would also fulfill the requirement that mitigation credits be obtained from the same non-attainment region as the project requiring mitigation. Negotiations between the State of Maryland and Sempra Generation to lease the credits are ongoing. Both parties are working to create a lease agreement that meets Sempra Generation's need to use the credits beginning in 2009 and the State of Maryland's need to offset emissions during 2007 and 2008. The number of credits required has been calculated for each of the two calendar years 2007 and 2008. Since the ratio used to calculate required NOx mitigation credits is 1 to 1, only the estimated amount of emissions for each year would be leased by the State of Maryland. It is proposed that all emission reduction credits will be secured prior to construction.